



U.S. Department
of Transportation
**Research and
Special Programs
Administration**

400 Seventh Street, S.W.
Washington, D.C. 20590

JUN 20 2002

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Reed D. Robinson
Vice-President, Field Services
Columbia Gas Transmission Company
P.O. Box 1273
1700 MacCorkle Avenue, SE
Charleston, WV 25325-1273

RE: CPF No. 1-2002-1004-H

Dear Mr. Robinson:

Enclosed is a Corrective Action Order issued by the Associate Administrator for Pipeline Safety in the above-referenced case. The Order places a pressure restriction on the line segment from Quakertown M&R station to Hellertown M&R station and the Easton Compressor station to the PA-NY state line.

Service is being made by certified mail and facsimile. Your receipt of the enclosed document constitutes service of that document. The terms and conditions of this Corrective Action Order are effective upon receipt.

Sincerely,

for Gwendolyn M. Hill
Pipeline Compliance Registry
Office of Pipeline Safety

Enclosure

VIA CERTIFIED MAIL (RETURN RECEIPT REQUESTED) AND TELECOPY

**DEPARTMENT OF TRANSPORTATION
RESEARCH AND SPECIAL PROGRAMS ADMINISTRATION
WASHINGTON, DC 20590**

In the Matter of)
)
Columbia Gas Transmission Company,)
)
Respondent.)
)

CPF No. 1-2002-1004-H

CORRECTIVE ACTION ORDER

Purpose and Background

This Corrective Action Order is being issued, under authority of 49 U.S.C. § 60112, to require Columbia Gas Transmission Company (Respondent) to take the necessary corrective action to protect the public and property from potential hazards associated with Respondent's Line 1278, which extends from Lancaster County at the Pennsylvania state line to the Delaware River at the Pennsylvania(PA)-New York (NY) state line. On May 13, 2002, Respondent reported that due to a safety-related condition, it lowered the maximum allowable operating pressure (MAOP) in three sections of Line 1278, from Easton to Stroudsburg, from Stroudsburg to Milford and from Milford to Millrift at the PA-NY state line.

On April 29, 2002, Respondent received the preliminary results of an internal inspection that was conducted on March 26, 2002 from Easton to Millrift. The internal inspection log identified approximately 800 anomalies on the pipeline with wall loss greater than 65 percent. Seventy-six (76) of the anomalies have wall loss equal to or greater than 80 percent and were pressure rated less than the MAOP of 1000 psig. On May 13, 2002, Respondent filed Safety-Related Condition Report (SRCR) No. 2002-0018 with the Office of Pipeline Safety(OPS).

Pursuant to 49 U.S.C. § 60117, the Eastern Region, OPS, initiated an investigation of the safety-related condition.

Preliminary Findings

1. Respondent's Line 1278, which consists of 147 miles of 20-inch and 14-inch pipeline, extends from Lancaster County at the Pennsylvania state line to the Delaware River at the Pennsylvania(PA)-New York (NY)state line. Line 1278 transports natural gas. Respondent is headquartered in Charleston, W. Va. and operates 12,750 miles of natural gas pipeline in the Northeast and Central regions of the country.

2. The coated 20-inch pipe extends about 29 miles from the PA state line to the Downingtown Compressor Station (Downingtown) and continues for 13 miles from the Hellertown metering and regulating (Hellertown) station to the Easton Compressor Station (Easton).
3. The coated 14-inch segment extends 51 miles from the Downingtown Compressor station to the Quakertown M&R Station (Quakertown). Eight miles in the 11-mile Quakertown to the Hellertown section is uncoated 14-inch pipe. The remaining 60 miles of pipe consists of 52 miles of uncoated 14-inch pipe from Easton to the PA-NY state line. There are four compressor stations on Line 1278: Downingtown, Eagle, Easton, and Milford.
4. On March 26, 2002, an internal inspection was performed on Respondent's Line 1278, in the 14-inch uncoated segment of pipeline from Easton to Millrift.
5. On April 29, 2002, Respondent received the preliminary results of the internal inspection conducted on March 26, 2002. The internal inspection log revealed approximately 800 anomalies on the pipeline with wall loss greater than 65 percent. Seventy-six (76) of the anomalies have wall loss equal to or greater than 80 percent: Easton to Stroudsburg twenty-six (26) anomalies; Stroudsburg to Milford forty-nine (49) anomalies. Three have been repaired. Milford to Millrift had one (1) anomaly. It has been repaired. Final internal inspection log results will be available in the first week of August 2002.
6. In response to the 800 anomalies that were identified, Respondent reduced the MAOP in three sections of the affected 14-inch pipeline:

Easton to Stroudsburg

950 psig to 900 psig on May 01, 2002

900 psig to 800 psig on May 14, 2002

800 psig to 600 psig on May 22, 2002 (< 30% Specified Minimum Yield Strength)

Stroudsburg to Milford

950/900 psig to 400 psig on May 15, 2002

400 psig to 50 psig, on June 7, 2002

Milford to Millrift at PA-NY state line

950/900 to 800 psig on May 14, 2002.

7. On June 7, 2002, in order to perform calibration digs and verify anomaly depths, Respondent had a six mile segment on the Stroudsburg to Milford section blown down. This segment is now valved in at 50 psig idle pipeline pressure.
8. Line 1278 originates at the Pennsylvania-Maryland border moving in a northeasterly direction into Pennsylvania through Lancaster County, Chester County, at the Downingtown compressor station and passes the Eagle compressor station where it continues in a northerly direction through Montgomery and Bucks Counties passing the Easton compressor station in Northampton, PA on into Monroe and Pike Counties and ends at the Delaware River NY-PA State line. The affected segment lies between the Eagle compressor station and Millrift at the

Delaware River NY-PA State line. The length of the affected segment of the pipeline is approximately 70.5 miles. Quakertown to Millrift is 11 miles and Easton to PA-NY state line is 59.5 miles.

9. Portions of the affected 14-inch segment are routed through small communities and cross numerous state and interstate highways.
10. Line 1278 was installed in 1948 without cathodic protection and was originally constructed of 14-inch bare, API 5LX seamless pipe manufactured by National Tube, with a specified minimum yield strength of 45,000 psig.
11. Cathodic protection on Line 1278 is provided by rectifiers and anodes. Portions of Line 1278 are located in rocky terrain where rock blasting was frequently used to install the pipe. In such areas it is difficult to acquire effective cathodic protection and meaningful cathodic protection readings.
12. In 1996 and 1997, an on/off close interval survey (CIS) was conducted Line 1278, from the insulator at Quakertown to the NY State line. As a result of this survey the following cathodic protection upgrades were implemented in 1997/1998.
 - Quakertown to Hellertown - 14 distributive ground beds consisting of 665 anodes were installed
 - Easton to NY State line - 41 distributive ground beds consisting of 1,896 anodes were installed
13. Respondent made 254 previous leak repairs between the Easton and the Millrift since the pipeline first went into service in 1948. This equates to about 4.30 leaks per pipeline mile. Most of the leaks were repaired within the past 10 years. The leak repair breakdown is as follows: one hundred and seventy-three (173) previous leaks were repaired in 1996 and 1997; seven leaks were repaired between 1993 and 1995; one leak was repaired in 1988; twenty-one (21) leaks were repaired in 1973 and 1974; thirty-one (31) leaks were repaired in 1966; and, eleven (11) leaks were repaired between 1954 and 1958. A majority of these leaks occurred in pipeline sections within 220 yards of paved roads and near buildings intended for human occupancy.
14. Since 1996, numerous short segments of the 14-inch pipe have been replaced and repaired. Respondent replaced the pipe with 14-inch diameter coated pipe, installed launchers and receivers and replaced valves. The replacement and repairs were made because of corrosion leaks and in areas where previous internal inspection tools had revealed corroded areas of pipe.
15. Currently, sixty (60) miles of Line 1278 does not have protective coating: Eight miles within the 11-mile Quakertown to Hellertown section and 52 miles from the Easton to the PA-NY state line.

16. On January 6, 1996, Line 1278 ruptured in a sparsely populated area about 50 miles northeast of Allentown in East Stroudsburg, PA. The gas ignited shortly after the rupture. This resulted in an uncontrolled burn and a brush fire. The force of the rupture excised a 30-foot section of pipe.
17. Since the January 6, 1996 incident, OPS has received six (6) SRCRs from Respondent that occurred on Line 1278. The reports were made on the following dates: April 02, 1996, July 19, 1996, November 15, 1996, December 05, 1996, April 16, 1997 and May 13, 2002.
18. The first five(5) SRCRs were reported after leaks in the 11-mile Quakertown to Hellertown section. These leaks were caused by localized corrosion and pitting on the pipe wall.
19. The latest SRCR dated May 13, 2002 was prompted by a preliminary internal inspection PII ultrasonic tool report that identified approximately 800 anomalies on the pipeline with wall loss greater than 65% between Easton and Millrift.
20. After the issuance of SRCRs for five reportable leaks, in March 1997 Respondent performed an internal inspection from the Quakertown to Hellertown. This prompted 85 bell hole inspections and the replacement of approximately three miles of uncoated pipe with coated pipe. The replacement of uncoated pipe with three miles of coated pipe removed twenty-one (21) previously installed leak clamps.
21. In June 1997, an internal inspection was performed by Pipetronix from Easton to the Millrift valve. This resulted in 139 bell hole inspections and the replacement of about 2.1 miles of uncoated pipe with coated pipe.
22. In 1998, a wireline was run in Line 1278 from the Millrift valve to the Delaware River at the PA-NY state line. One calibration dig was performed to verify reported anomalies. The MAOP of this section was retained at 1000 psig.
23. In 1999, a follow-up CIS was performed to determine whether Respondent was achieving the 100 mV polarization shift cathodic protection criteria. The CIS revealed that there are still sections of uncoated pipe on Line 1278 that do not meet the 0.85 V or 100 mV shift criteria. Additional anodes must be installed to achieve the 100 mV polarization shift. As of the date of this Order, Respondent has not received permits from local authorities to install 155 anodes in the Pike, Monroe, Lehigh, and Northampton counties. Respondent has not performed follow-up surveys in the pipeline sections where distributed anode ground beds and continuous anode flex cable were installed.
24. The Quakertown to Hellertown section is scheduled for an internal inspection in early 2003.
25. Respondent is currently maintaining a pressure reduction on the affected segments of Line 1278.

Determination of Necessity for Corrective Action Order and Right to Hearing

Section 60112 of Title 49, United States Code, provides for the issuance of a Corrective Action Order, after reasonable notice and the opportunity for a hearing, requiring corrective action, which may include the suspended or restricted use of a pipeline facility, physical inspection, testing, repair, replacement, or other action as appropriate. The basis for making the determination that a pipeline facility is hazardous, requiring corrective action, is set forth both in the above referenced statute and 49 C.F.R. §190.233, a copy of which is enclosed.

Section 60112, and the regulations promulgated thereunder, provides for the issuance of a Corrective Action Order without prior opportunity for notice and hearing upon a finding that failure to issue the Order expeditiously will result in likely serious harm to life, property or the environment. In such cases, an opportunity for a hearing will be provided as soon as practicable after the issuance of the Order.

After evaluating the foregoing preliminary findings of fact, I find that the continued operation of this pipeline without corrective measures would be hazardous to life and property. Additionally, after considering the circumstances surrounding the 800 anomalies found by internal inspection, the proximity of the pipeline to populated areas, the line's proximity to public highways, the highly combustible nature of the product the pipeline transports, the pressure required for transporting the material, and the uncertainties as to the cause of the anomalies, I find that a failure to issue expeditiously this Order, requiring immediate corrective action, would result in likely serious harm to life and property.

Accordingly, this Corrective Action Order mandating needed immediate corrective action is issued without prior notice and opportunity for a hearing. The terms and conditions of this Order are effective upon receipt.

Within 10 days of receipt of this Order, Columbia may request a hearing, to be held as soon as practicable, by notifying the Associate Administrator for Pipeline Safety in writing, delivered personally, by mail or by telecopy at (202) 366-4566. The hearing will be held in Washington, DC on a date that is mutually convenient to OPS and Respondent.

After receiving and analyzing additional data in the course of this investigation, OPS may identify other longer term measures that need to be taken. Columbia will be notified of any additional measures required and amendment of this Order will be considered. To the extent consistent with safety, Columbia will be afforded notice and an opportunity for a hearing prior to the imposition of any additional corrective measures.

Required Corrective Action

Pursuant to 49 U.S.C. § 60112, I hereby order Columbia to immediately take the following corrective actions with respect to Line 1278 from Quakertown to Hellertown and from Easton to the Delaware River on the PA-NY state line.

A. With respect to the 14-inch pipeline from the Quakertown M&R Station to the Hellertown M&R Station:

- 1) Maintain the current pressure reduction on the pipeline segment from the Quakertown to the Hellertown. MAOP from Quakertown to Hellertown is not to exceed 600 psig. This restriction is to remain in place until the results of the internal inspection required in Item 4 and the calculations required in Item 9 verify the integrity of pipeline and written approval is obtained from the Director, Eastern Region.
- 2) Within 15 days of receiving this Order, submit to the Director, Eastern Region a set of alignment maps for the pipeline segment from the Quakertown to the Hellertown. The maps must identify and segregate class location areas, identify locations of all leak repairs or pipe replacement resulting from leaks, and the date last revised.
- 3) Within 90 days of receipt of this Order, verify whether the cathodic protection criteria (0.85 V or 100 mV polarization shift) is being met. In the interim, conduct weekly foot patrols with leakage detection equipment until preliminary internal inspection results are made available.
- 4) Within 90 days of receipt of this Order, internally inspect the pipeline segment. Commission a third-party consultant to examine the internal inspection logs and tabulated results and analyze the remaining strength calculations reported by the vendor.
- 5) Submit to the Director, Eastern Region, the preliminary internal inspection report within five days of receiving it from the vendor.
- 6) Within one week of receiving the final internal inspection report from the vendor, submit the tabulated results to the Director, Eastern Region. The Director, Eastern Region, may have a third-party consultant review the internal inspection logs and tabulated results, which will require access to the electronic image file.
- 7) Within 15 days of receiving the final internal inspection report from the vendor, submit to the Director, Eastern Region, an updated set of alignment maps for this pipeline segment identifying the locations of all wall loss anomalies color coded by severity.
- 8) Develop a mechanism to verify that all anomalies that can adversely impact the integrity of the pipeline segment are discovered and repaired. Establish written criteria and methodologies for the evaluation of anomalies reported by the internal inspection vendor, removal or repair of anomalies, and testing to be conducted to confirm the soundness of the repairs.

- 9) Within 5 days after receiving the preliminary report from the internal inspection vendor, determine the safe MAOP for all anomalies that, in the opinion of Respondent and other independent metallurgical and pipeline engineering consultants, meet the criteria listed below. The safe MAOP is the calculated MAOP based on remaining wall thickness or 600 psig, whichever is the lower pressure.
- Require repair or removal immediately.
 - Require a temporary operating pressure reduction or shut down the pipeline until the operator completes the repair of these conditions.
 - Have metal loss greater than 80% of nominal wall regardless of diameter.
 - A calculation of the remaining strength of the pipe shows a predicted burst pressure less than the established maximum operating pressure at the location of the anomaly.
 - A calculation of the remaining strength of the pipe shows an operating pressure that is less than the current established maximum operating pressure at the location of the anomaly.
 - Predicted metal loss greater than 50% of nominal pipe wall that is located at a crossing with another pipeline, or is in an area with widespread circumferential corrosion, or is in an area that could affect a girth weld.
 - Anomalies that cannot support a restoration of pressure.
- 10) Calculate the safe MAOP of all the anomalies that do not fall within the criteria above.
- 11) Identify and report those anomalies that will be repaired or removed from the pipeline.
- 12) Maintain the current MAOP, or the lower pressure required under Item 9, of the pipeline segment until all anomalies meeting the criteria in Item 9 are repaired or removed.

B. With respect to the 14-inch pipeline from the Easton Compressor Station to the Delaware River crossing at the PA-NY state line:

- 1) Maintain the current pressure reduction on the pipeline segment from the Easton to the Delaware River crossing at the PA-NY state line. Maximum allowable operating pressure from Easton to the Delaware River crossing at the PA-NY state line is not to exceed 600 psig in the Easton to Stroudsburg section, 50 psig in the Stroudsburg to Milford section, and 800 psig in the Milford to Millrift to PA-NY state line. This restriction is to remain in place until all critical anomalies (defined in A-9) are repaired or removed and written approval is obtained from the Director, Eastern Region.

- 2) Should the Stroudsburg to Milford segment, which is currently under idle pipeline pressure of 50 psig, need an increase to a higher MAOP to meet winter heating demand, then the Respondent must demonstrate to the Eastern Region Director in writing that the remaining pipeline wall loss anomalies in this segment will be able to support the pressure increase.
- 3) Within 10 working days of receiving this Order, submit calculations to show that existing MAOP of 600 psig and 800 psig can be safely supported by the Easton to Stroudsburg segment and the Milford to PA-NY state line segment, respectively.
- 4) Submit internal inspection log and tabulated values to the Director, Eastern Region. The Eastern Region Director may have a third-party consultant verify that all critical anomalies have been discovered, which will require access to the electronic image file.
- 5) Commission a third-party consultant to examine the internal inspection logs and tabulated results and analyze the remaining strength calculations reported by the vendor.
- 6) Within 15 days of receiving the final internal inspection report from the vendor, submit to the Director, Eastern Region, an updated set of alignment maps for this pipeline segment identifying the locations of all wall loss anomalies color coded by severity.
- 7) Develop a mechanism to verify that all anomalies that can adversely impact the integrity of the pipeline segment are discovered and repaired. Establish written criteria and methodologies for the evaluation of anomalies reported by the internal inspection vendor, removal or repair of anomalies, and testing to be conducted to confirm the soundness of the repairs.
- 8) Within 5 days after receiving the preliminary report from the internal inspection vendor, determine the safe MAOP for the most critical anomalies on the two pipeline segments. The safe MAOP for the Easton to Stroudsburg segment is the calculated MAOP based on remaining wall thickness or 600 psig, whichever is the lower pressure. The safe MAOP for the Milford to PA-NY state line segment is the calculated MAOP based on remaining wall thickness or 800 psig, whichever is the lower pressure.

Within 45 days of receiving the final report from the internal inspection vendor, determine the safe MAOP of the remaining anomalies. In no case will the safe MAOP be greater than 600 psig for the Easton to Stroudsburg segment or 800 psig for the Milford to PA-NY state line segment.

- 9) Identify and report those anomalies that will be repaired or removed from the pipeline.

C. All Uncoated Pipeline Segments

Take the following steps with respect to all uncoated pipeline segments from the Quakertown to the Hellertown and from the Easton to the PA-NY State Line:

- 1) Develop a written plan for remedial action to mitigate the continuing growth and occurrence of anomalies identified by the internal inspection tool and by any other means during execution of the repair program. The written plan should include provisions for:
 - i) Determination of the cause and contributing factors to the occurrence and continuing growth of anomalies.
 - ii) Determination of the cause and contributing factors for any additional anomalies detected by means other than the internal inspection tool, i.e. visual observation.
 - iii) Performance of appropriate survey and/or testing programs to be used in regard to Items (i) and (ii) above.
 - iv) Performance of close-interval, current interrupted, side drain, pipe-to-soil potential surveys, and other appropriate testing to determine the adequacy of the corrosion control applied to the pipeline after repairs have been made.
 - v) Determine by engineering analyses the location and number of test wires required to adequately monitor the pipeline for cathodic protection.
- 2) Using Geographic Information Systems (GIS) technology collect data at all points of pipeline inflection from Quakertown to Hellertown and from Easton to the Delaware River at the PA-NY state line and submit data to the National Pipeline Mapping System using their standards.
- 3) Submit a written pipeline remediation (repair or removal) plan at those locations where the remaining strength of the pipe is less than the pre-1996 MAOP. Consider tool tolerances in identifying those wall loss anomalies that could adversely affect the pipeline's integrity.
- 4) For the pipeline segment from the Easton to the PA-NY state line, submit a written plan to replace pipe sections with clusters of repairs or removals after superimposing and integrating the 2002 PII internal inspection wall loss anomaly data. A cluster is defined as a one-mile long pipeline segment with five or more repairs or pipe

replacement resulting from all previous leaks in the pipeline. The cluster includes pipe repair or replacement resulting from 2002 PII internal inspection.

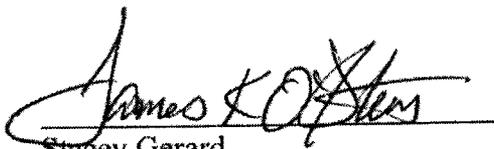
- 5) For the Quakertown to Hellertown segment, submit a written plan to replace pipe sections with clusters of repairs or removals after superimposing and integrating the internal inspection results required in A-4. A cluster is defined as a one-mile long pipeline segment with five or more repairs or removals in the pipeline's history.
- 6) Submit a written pipe replacement plan that has been prioritized after considering at least the following factors: Class Locations; safety sensitive areas defined as an area that extends 220 yards from a public paved road, a public gathering area, or any building intended for human occupancy; leak history; final internal inspection report; and, number of leak repairs or pipeline removals. Incorporate foreseeable class location changes based on regional development history into account.
- 7) Replace the affected uncoated 14-inch diameter pipe using the following guidelines:
 - In Class 3 areas replace within two years.
 - In Class 2 areas replace within three years.
 - In Class 1 areas replace within five years.
- 8) Submit the written plans for Items A, B & C, addressing repair, remedial action, and cathodic protection to the Director, Eastern Region, for review.
- 9) Each element of the plan must be approved by the Director, Eastern Region, who may provide approvals incrementally. Implement the plan as approved.
- 10) Provide detailed reports to the Director, Eastern Region, of findings and actions taken to repair the pipeline identifying the anomalies detected and evaluated, their location circumferentially on the pipe, the characterization of the anomalies (type and size of defect), the severity of the anomaly, and the repair action taken, including the size predicted by the internal inspection tool and the actual size. Additionally, provide a summary by type of defect of the number of anomalies identified by the tool, the number of actual anomalies found, and number repaired.
- 11) Respondent must request approval from the Director, Eastern Region to remove or modify the self-imposed pressure restriction of the pipeline segments. The request must demonstrate that the hazard has been abated and that a higher pressure is justified based on an analysis showing that the pressure increase is safe considering all known defects, anomalies and operating parameters of the pipeline.
- 12) Respondent will each month submit status reports on the types of repairs or removals completed, cathodic protection readings, new leak discoveries, number of distributed anode ground beds installed, anomaly discoveries, and other pertinent facts as applied to this Order.

- 13) The Director, Eastern Region, may grant an extension of time for compliance with any of the terms of this order for good cause. A request for an extension must be in writing.

Respondent may appeal any decision of the Director, Eastern Region to the Associate Administrator for Pipeline Safety. Decisions of the Associate Administrator shall be final.

The procedures for the issuance of this Order are described in Part 190, Title 49, Code of Federal Regulations, § 190.233, a copy of which is enclosed, is made part of this Order and describes the Respondents' procedural rights relative to this Order.

Failure to comply with this Order may result in the assessment of civil penalties of not more than \$25,000 per day and in referral to the Attorney General for appropriate relief in United States District Court.



Stacey Gerard

71 Associate Administrator
for Pipeline Safety

JUN 20 2002

Date Issued